A CASE STUDY: PERFORMANCE EVALUATION OF POWER TILLER DURING PLOUGHING BETWEEN SLOPES 0° - 2° IN DRY PADDY FIELD

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ABSTRAK

KAJIAN KES: PENILAIAN PRESTASI POWER TILLER SEMASA MEMBAJAK PADA KECERUNAN 0 ° - 2 ° DI DALAM PENANAMAN PADI KERING

Power Tiller adalah jentera dua roda yang digunakan dalam penanaman padi bertujuan untuk membajak tanah. Penyelidikan ini bertujuan untuk menilai prestasi Power Tiller sebagai jentera pembajak tanah dalam penanaman padi. Dalam kajian ini, 5 plot telah digunakan pada kecerunan 0 ° - 2 ° dan saiz bagi setiap plot adalah 10 m x 10 m atau 0.01 hektar. Keputusan yang diperolehi adalah dari parameter berikut: kapaciti yang efektif bagi jentera semasa pembajakan, kecekapan mesin, kelajuan jentera semasa operasi, kedalaman pembajakan, penggunaan bahan api dan kos bahan api. Keputusan bagi purata kecekapan jentera yang diperolehi ialah 61,79% dan kapasiti yang efektif untuk jentera berkerja semasa pembajakan adalah 0,0511 hektar/jam. Penggunaan bahan api adalah 32.04 L / ha dan kos bagi bahan api ialah RM47.69 bagi setiap hektar. Satu lagi objektif penyelidikan telah dijalankan untuk menguji hubungan kelajuan berbanding kedalaman pembajakan, dan bahan api berbanding kapasiti yang efektif bagi jentera semasa pembajakan dengan menggunakan kaedah regrasi. Keputusan menunjukkan bahawa r-square yang diperolehi bagi hubungan di antara kelajuan berbanding kedalaman pembajakan adalah 81.7%. Manakala hubungan di antara kapasiti yang efektif bagi jentera semasa pembajakan berbanding penggunaan bahan api adalah 84.8%, yang menunjukkan hubungan bagi kedua-dua pemboleh ubah adalah kuat. Kajian mendapati bahawa penggunaan Power Tiller sebagai jentera pembajak tanah lebih menjimatkan masa dalam proses penyediaan tanah dan memperolehi lebih kuasa berbanding kaedah tradisional. Oleh itu, Power Tiller sesuai digunakan bagi petani kecil di Malaysia.

CHAPTER 1

INTRODUCTION

1.1 Research Background

The implementation of mechanization is intended for all operations in paddy cultivation as an important thing, to maximize the production of paddy yield and the quality of the grain. The use of mechanization in paddy cultivation is replacing the animal power which mostly used for land preparation (Sutjana and Widana, 2005). The power tiller is a machine that commonly used in growing countries for paddy cultivation by the small scale farmers to plough their land. Power tiller is a multipurpose two wheel tractor as an equipment to prepare seedbeds in paddy cultivation (Subrata and Atanu, 2011). The power tiller is suitable for land preparation in paddy fields, dry paddy field, vegetable fields, and hilly land with a little inclination (Adamu, Jahun and Babangida, 2014). Therefore, the use of power tiller for ploughing operation in dry paddy cultivation had improved farm productivity. The implementation of power tiller proved to reduce labour usage as well as efficiency of working time and improve the productivity of the farm (Ademiluyi *et al.,* 2008). Although, the utilization of power tiller should be in proper manner in order to enhance the efficiency of this machine and knowing the factors that leads to the decreasing in efficiency are supposedly under consideration. In consequence, this research mainly discussed on performance evaluation of power tiller during ploughing operation in dry paddy field between slopes 0° - 2°.